

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

Strategic Plan for Asset Management



Draft

9/6/2017

Foreword

The Strategic Plan for Asset Management provides an overall structure and guidance for the NHDOT to move toward true, proactive asset management. This plan is for a 5-year period and will be reviewed and updated as necessary every 2 years.

Asset management is a philosophy for managing that relies on good data, economic analyses, expert knowledge, and systems to recommend investment decisions through a transparent and repeatable process to achieve desired performance outcomes for minimal practicable cost. That translates to good information about when a preservation strategy is most applicable, when rehabilitation is optimal, and when replacement should be planned. Such information will help the Department understand the benefits and tradeoffs of different investment options so that we can make more informed decisions that balance investment alternatives with available resources to achieve desired outcomes.

The development and documentation of desired outcomes is a collaborative and iterative process involving the NHDOT, general public, Governor, Executive Council, Legislature, and other partners. Asset management provides the framework to develop a common understanding of the linkages between performance outcomes, investment alternatives, and the resources involved.

Transparency and repeatability is an essential aspect of asset management that goes a long way toward building confidence and trust with all stakeholders in the transportation system. Transparency coupled with the other aspects of asset management, including good data, informed decisions, and collaboratively developed performance goals, will help ensure the best outcome for the transportation system in New Hampshire.

The Strategic Plan for Asset Management is part of NHDOT's overall approach for improving asset management practices, policies, and tools where they already exist along with developing new ones where they do not. The approach is multidisciplinary and designed to move forward at both the strategic and tactical levels using empowered work groups, coordination and facilitation led by the Asset Management, Performance, and Strategy work unit, continued engagement with DOT leadership, and the involvement of individuals that are or will be accountable for various assets, systems, and data.

Introduction

For more than 100 years, the New Hampshire Department of Transportation (NHDOT) has been charged with the care of the State’s transportation system. For all of those years, the Department has been managing assets by deciding which improvements to make and how best to approach them. In that regard the essence of asset management is not new and has been at the core of the Department’s mission since the NHDOT was created. However, Asset Management, as a more formal, documented, and data-driven process, is new to the Department. The purpose of this Strategic Plan for Asset Management is to provide a framework for achieving the Department’s asset management vision and goals.

Mission:

Transportation excellence enhancing the quality of life in New Hampshire.

Purpose:

Transportation excellence in New Hampshire is fundamental to the state's sustainable economic development and land use, enhancing the environment, and preserving the unique character and quality of life. The Department provides safe and secure mobility and travel options for all of the state's residents, visitors, and goods movement, through a transportation system and services that are well maintained, efficient, reliable, and provide seamless interstate and intrastate connectivity.

Asset Management Vision:

Transportation assets are known and well understood by NHDOT personnel. Knowledge of assets is used in a strategic and systematic process for maintaining, preserving, and improving the transportation assets based on economic analysis, engineering, age/use of asset, and customer focused feedback considerations. The Department forecasts what will happen when we make investments in assets and what the future needs are of those assets to meet established performance goals. NHDOT is able to compare and quantify the tradeoffs made when investing in one asset over another. Personnel are able to communicate relevant asset information across the Department, to other stakeholders in transportation, to the legislature, and to the public. Decisions are based on high quality data, integrated systems, and accessible information.

Asset Management Vision Simplified:

- *What we have*
- *What we need to do*
- *What will happen when we do it*

Strategic Approach

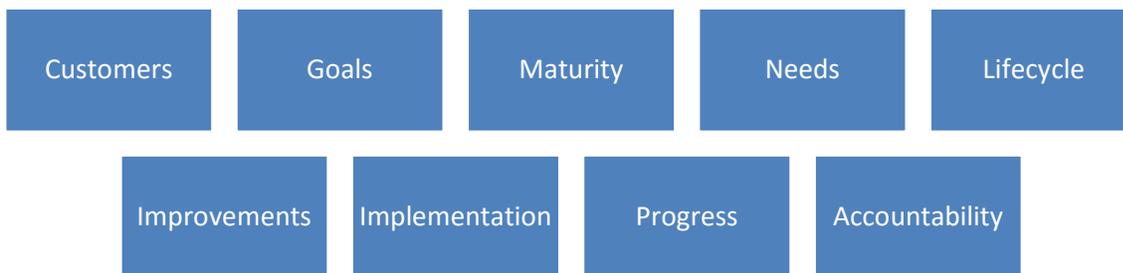
The approach to asset management at NHDOT is holistic and distributed, focusing on conversations across the Department rather than having a single work unit responsible for everything. This approach relies on multidisciplinary workgroups that view assets and asset management from 5 different focus areas (Figure 1). This approach enables personnel throughout the Department to use a systematic process that considers various inputs, evaluates potential outcomes, recommends efficient investment strategies, and monitors both implementation and outcomes for the entire lifecycle, for the implementation of asset management for each type of asset. This approach also builds a common foundation between assets, data, and systems that will enable the Department to perform cross asset analyses in the future as well as provide consistent and accurate information to stakeholders.

Figure 1 – Asset Management Focus Areas



To facilitate an agile review, development, and decision making process, separate small workgroups representing each focus area were developed with coordination from the NHDOT Commissioners and the Office of Asset Management, Performance, and Strategy (AMPS). This approach enables the workgroups to look across assets and the Department to identify areas that can be improved through common approaches and tools.

Each transportation asset is reviewed with regard to these focus areas by the workgroups initially and then on a recurring basis to monitor progress. While each focus area provides a unique perspective of an asset there are common concepts considered, including:

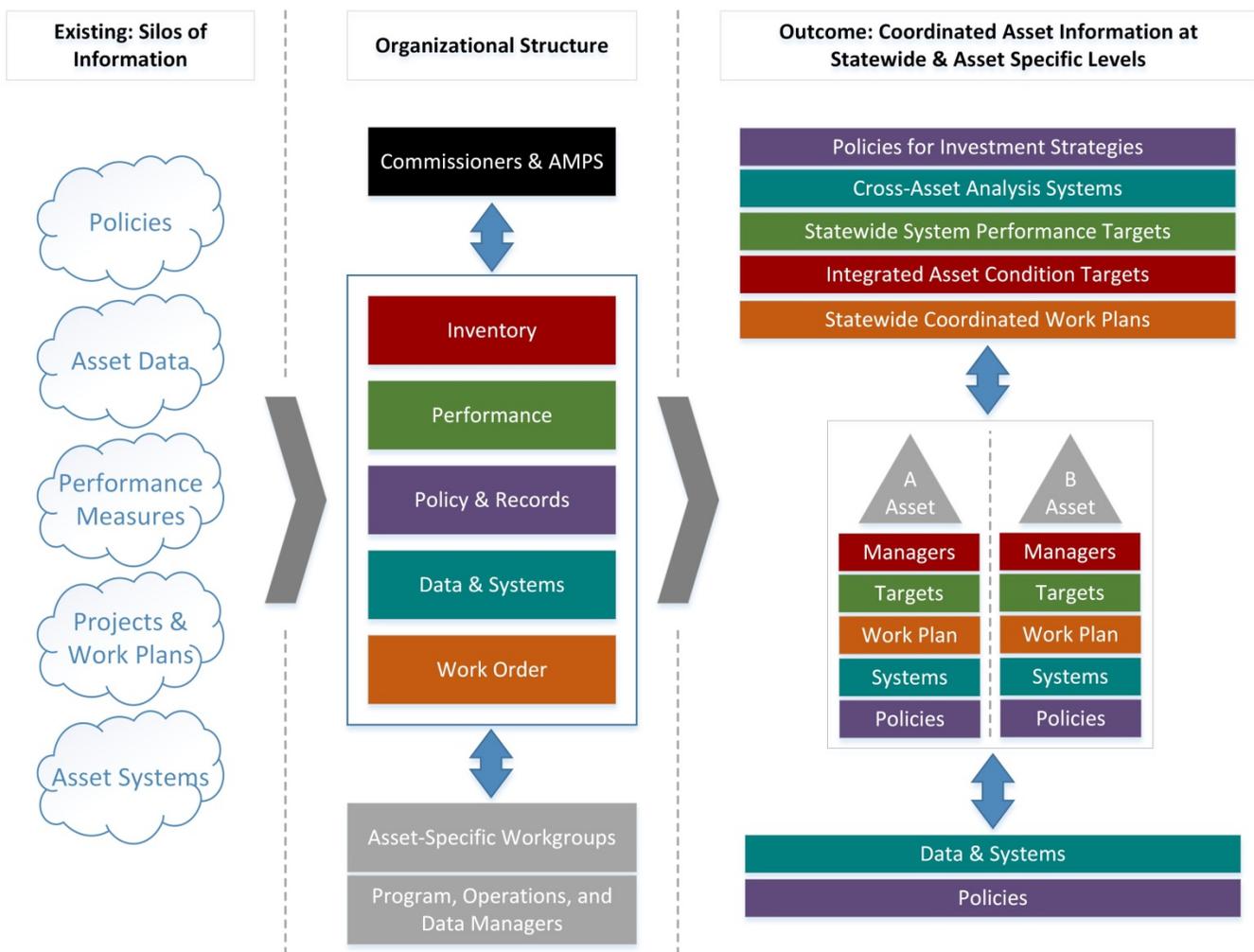


Each workgroup, partnering with subject matter experts, works through the common concepts to develop a deep understanding of an asset, including what are the asset-level goals and avenues to achieve them. Once documented and directed, individuals and groups who are accountable for various components of an asset

during the life-cycle will develop plans for achieving the goals. Those individuals and groups will be responsible for delivering on the plans, for keeping them up-to-date, and for reviewing progress with senior management and the AMPS work unit. The workgroups, commissioners, and AMPS will also collaborate, guide, and communicate information to other committees, workgroups, and work units that operate across assets.

Through this approach we will review our existing policies, asset data, performance measures, work plans, projects, and systems to improve and coordinate asset information (Figure 2). The result will be improvements at both the tactical and strategic levels. At the tactical level gaps will be filled and clear relationships will be established between each asset, the systems and data involved, the individuals accountable, how we will measure performance and define success, and the policies that guide and codify all those aspects. At the strategic level we will understand the commonalities across assets in relation to performance, condition, work plans, priority, and the policies involved. The consistency gained through this process will enable data-driven decision making for the prioritization of investment across assets.

Figure 2 – Strategic Approach



The Department recognizes that to the traveling public there is no difference between a transportation asset that is owned by NHDOT and one that is owned by a municipality; both gets people and goods from point A to point B. Wherever possible the processes, approaches, information, and tools developed to support NHDOT

owned and managed transportation assets will be discussed with and shared with our partners in the transportation system. In addition, through investment strategies, NHDOT will look for ways to incentivize good asset management practices for infrastructure that is owned and operated by others within the State of NH.

Focus Areas

The asset management focus areas are outlined briefly below (Figure 3) and in more detail in the subsequent pages. For each focus area there is a brief discussion of what the focus area includes, goals for the focus area, and a general outline of some tasks to be undertaken within each area. Each workgroup assigned to the focus areas will be responsible for developing a plan to achieve the associated goals and will be responsible for managing the implementation of the plan.

Figure 3 – Focus Area Summary

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| Inventory | Identify what information is important to know about each transportation asset, how the information will be collected and maintained, and each of the responsible parties involved. |
| Work Order | Identify who plans and performs work on each transportation asset, what the business needs are for those activities, including tracking and reporting, and how inventory data and performance measures are utilized. |
| Performance | Define goals and targets for each transportation asset, identify key performance measures and reporting requirements, develop a framework for evaluating the efficiency of investment decisions, maintain a risk register, and monitor the application of risk mitigation strategies. |
| Data & Systems | Understand customer and Department business needs, align those needs with IT-based solutions, including priorities for maintenance, improvement, integration, and procurement/development, and monitor the implementation of the solutions. |
| Policy & Records | Policy-related documents are maintained and accessible, roles and responsibilities are well defined and documented, and record retention, including both traditional files and data, is clear. |

The AMPS work unit will strive to ensure that the individual efforts of each workgroup are coordinated and orchestrated to efficiently move toward the asset management vision for NHDOT. Personnel from AMPS will be involved with each workgroup and will coordinate on a routine basis with the Commissioners. AMPS staff will provide assistance, through training, guidance, and instructions, to those accountable for managing assets and will also assist with the development of tools when appropriate.

Inventory

Inventories are an essential component of asset management because they form the basis of good decision making and the development of investment strategies. The collection and maintenance of an inventory consumes resources and must therefore be carefully planned, evaluated, and managed to ensure that the benefits outweigh the costs.

The Inventory focus area is primarily concerned with identifying the assets that NHDOT is responsible for and determining what attributes are important to collect. Also covered by this focus area are issues relating to data quality, how current the information needs to be, who is responsible for the data and inventory, and monitoring related efficiency.

Through this focus area the NHDOT will identify commonalities across asset inventories. These may include common collection methods, data requirements, analytics, update frequencies, and customers. The Department will determine how to efficiently leverage these commonalities through frameworks, processes, tools, systems, and data management.

Road Map

- Develop information about each asset including who the program managers, operational managers and data owners are or will be. Include a process and responsible party to keep this information up-to-date.
- As a pilot initiative, work through 3 high priority transportation assets to understand the details of a thorough approach for the development, maintenance, and use of asset inventories. For each asset in the pilot, document business needs, develop collection, maintenance, and data quality management plans, and document performance measures.
- Use the information gained during the pilot initiative to:
 - Develop frameworks for the overall process, including the collection and data quality management plans;
 - Develop or identify the need for assistance to develop and enhance tools for evaluating the cost effectiveness of inventory collection and maintenance options;
 - Review the accountabilities of those responsible for managing components of each asset inventory to ensure they are still valid and complete.
 - Develop common approaches for monitoring the implementation of the inventory build-out plans, including data quality;

Goals

- Responsible parties for each asset are documented.
- There is documentation of what attributes are necessary for good decision making.
- Collection, maintenance, and data quality management plans are in place for each asset.
- We are confident that our inventory methods are adequate, efficient and provide the desired information.
- Information about asset inventories is comparable and used for cross asset analyses.
- Common and efficient approaches and tools are identified and documented for asset inventories.
- Inventory data is accurate, well curated, and serves as a single source of truth.

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- Identify and document common requirements of inventory systems, including data curation and publication;
 - Identify any policies or procedures that need to be documented, mapped, or revised.
- On a priority basis work through the transportation assets with program managers to develop collection, maintenance, and data quality management plans for the remaining assets.
- Monitor the implementation of the inventory plans according to schedules developed for each asset.
- Monitor the inventory data quality and evaluate efficiency on a systematic basis. Work with program managers, data owners, and data collection owners to make adjustments for continuous improvement.

Work Order

The core of NHDOT, as evidenced by the personnel working in the field and all the employees contributing to the delivery of projects, is performing work on transportation assets. Work Order is essentially an umbrella phase that encompasses how work is planned, prioritized, performed, and tracked across the Department on transportation assets.

The Work Order focus area is expansive and includes everything from identifying the need for an investment to planning the work to completing it. As such, there are many facets to this focus area including: 1) determining what we need to track for each asset, 2) identifying who is involved in the process, 3) developing work plans and project selection processes that are outcome driven, 4) articulating processes and data flows for efficiently conveying the need for work and tracking it, 5) developing ways to monitor the process and evaluate efficiency, and 6) developing tools to conduct tradeoff analyses for varied investment levels across assets.

Work that is planned and undertaken by NHDOT, through the Department's own forces or through contracts, must be clearly tied to the achievement of desired outcomes. Those outcomes are the result of discussions with various stakeholders, including the Legislature and the general public. Establishing those clear connections will help ensure that everyone understands why particular projects and activities are planned and undertaken by NHDOT as well as help prioritize those efforts. While the desired outcomes will be considered through the Performance focus area, this focus area is concerned with the identification of projects and activities to achieve those outcomes.

Road Map

- Determine what an enterprise approach for work order would include, what the processes involved would be, and what data is part of the processes. Use that information to better understand what work order could be and to articulate business needs for NHDOT that can be applied broadly.
- As a pilot initiative work through 3 high priority transportation assets to understand the details of a thorough approach for work order including:
 - Document the information that is necessary to make good investment decisions, to plan the tactical components of performing work, to actually do the work, to monitor the work, to know when the work is complete, to know what was accomplished, and to know the resources used to complete the work;

Goals

- There is documentation of what information is essential for planning and performing work on assets.
- We have good information about work being planned, as it is performed, and when the work is complete.
- Performance outcomes and investment strategies are used to develop work plans and to prioritize projects across assets.
- We evaluate and monitor the work so that we can be confident that it is performed efficiently.
- We understand, plan for, and manage for the whole life-cycles of assets.
- Data about Work Order is accurate, well curated, and serves as a single source of truth.

- Develop business needs;
- Document existing and new processes; and
- Develop plans to make any improvements that are identified.
- Use the information gained during the pilot initiative to:
 - Develop a framework for defining work order needs, documenting existing practices, and prioritizing improvements that can be applied to other assets, including linking needs and planned work with the achievement of desired performance outcomes;
 - Develop or identify the need for assistance to develop and enhance tools for evaluating the cost effectiveness of different approaches to work;
 - Develop a process to identify gaps between the responsibilities of employees involved with work order and the business needs and related policies, procedures, and work instructions.
 - Develop common approaches for monitoring the implementation of improvements to the work order process;
 - Identify and document common requirements of work order systems and components of existing systems that do not meet business needs;
 - Identify any policies or procedures that need to be documented, mapped, or revised.
- For each transportation asset, on a priority basis, work with those planning and performing work to complete the frameworks established through the pilot process to document work order business needs and to plan for improvements.
- Develop and apply performance measures for each transportation asset that monitor the efficiency of NHDOT and contracted forces performing the work as well as how well the work achieves the desired performance outcomes.

Performance

This strategic approach to asset management, particularly because it is distributed across the Department, requires that goals and targets for transportation assets and for the management of them are documented, clear, and well communicated. A core component of asset management is that investment decisions are tied to specific performance outcomes as determined through interaction with the legislature, interested parties and the general public and that investments to achieve those outcomes are made at minimum practicable cost. The Performance focus area will help ensure that the Department always considers both cost and outcome for each asset, for the transportation system, and for our workforce.

As part of this focus area, performance goals and targets will be developed along with processes to monitor them for each transportation asset. In addition, the efficiency of Department processes, personnel, and investment decisions will be considered. Guidance on analyses, like net present value and cost-benefit will be created for evaluating investment alternatives.

Road Map

- Develop information about existing performance measures. Work with those who are responsible for producing the measures and with those accountable for the performance to determine any efficiency that can be gained from consolidating measures.
- Develop a framework for the consistent, systematic, repeatable, and transparent reporting of transportation asset performance information.
- On a priority basis, work through the transportation assets to develop performance goals. Work with asset managers to review the goals, discuss how they could be implemented over time, and document any obstacles.
- For assets with inventory data available, work with asset managers to develop realistic targets. As data becomes available for more assets work with those managers.
- For each asset, determine the level of detail needed for modeling and forecasting to predict future conditions and to evaluate investment decisions.
- Develop processes to compare work plans, including the 10-Year Plan, to performance goals and targets.
- Develop a framework to measure and monitor the performance of NHDOT personnel and contractors/consultants
- Monitor the implementation of plans toward achieving the department and asset level goals and targets.

Goals

- Performance goals and targets are documented for all assets and personnel.
- Work plans and project selection criteria are developed to meet performance targets.
- Information about performance is transparent and accessible.
- Essential reporting requirements are documented and linked to personnel responsible for preparing them.
- Individuals are held accountable for performance.
- Data about Performance is accurate, well curated, and serves as a single source of truth.

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- Monitor the inventory data quality and process efficiency on a routine basis and work with program managers, data owners, and data collection owners to make adjustments.
- Define the business needs for sharing performance data across the Department and with other stakeholders.

Data & Systems

A core component of asset management is making decisions that are based on good data. That data is a valuable resource for the Department and must be managed carefully and efficiently. How that management occurs to meet the business needs of the Department is one of the primary concerns of this focus area.

Through this focus area the NHDOT will identify ways to leverage systems and tools to make the Department more efficient. Tools like mobile devices, unmanned aerial vehicles (drones), remote sensing equipment, and new software applications, when planned for and managed may improve efficiency. The integration of those tools and the related data streams across the enterprise will certainly help the Department make substantial efficiency gains. As systems become integrated and more data becomes available many of the processes that today may be time consuming and error-prone can become automated through transparent and repeatable approaches.

As business needs are identified through the other focus areas, this lens will enable the Department to consider solutions to meet those needs and to develop plans for investing in or disinvesting from existing systems.

Road Map

- Develop an understanding of NHDOT systems, data, and those who interact with both to document the relationships.
- Document each system and business rules associated with the development of systems so that they are easily maintained as rules change.
- Review existing NHDOT asset management related systems to determine what level of continued investment is appropriate.
- Work with transportation asset managers and others as business needs are developed to determine what solutions may be appropriate and available.
- Develop a plan for integrating asset data across assets, with GIS, and with other data sets and systems.
- Develop a framework for transportation asset data that managers and data owners can utilize to ensure high quality data.
- Provide direction on data governance for the Department.
- Determine how data and information can be made accessible across the Department and with external stakeholders.

Goals

- There is a single source of data with a clear owner.
- Data about assets is integrated and managed efficiently.
- We understand the customer needs for asset data.
- Business rules are integrated into systems to increase efficiency and minimize training.
- We have a plan for which systems we invest in and which we do not.
- Data flows between systems to minimize any duplicate data entry.
- The right data is accessible to the right people.
- Data governance is integrated into our way of doing business and our systems.

Policy & Records

The Department's principles, intent, position, and course of action are codified through policies and procedures. In order for asset management to become part of the fabric of the Department over the long-term, the principles and concepts of asset management must be, as appropriate, incorporated directly in new policies or related to existing policies. That review, update, and documentation process is a primary concern for this focus area.

Connecting positions, roles, and responsibilities to policies and procedures is critically important for the success of asset management at NHDOT. The structured nature of asset management is a change for the Department and being able to clearly show the connections between policies, procedures, roles, positions, and responsibilities will go a long way toward alleviating the inherent difficulties associated with change.

Road Map

- Develop information about existing policies and procedures within the department. Identify any gaps in policies or procedures, both in regards to out-of-date information and missing/incomplete information.
- To develop a centralized and easily accessible and user friendly SOS framework to efficiently and effectively house policies and procedures.
- Develop an understanding of who the policies, procedures, and related information apply to, socialize the information with those affected, and ensure that any related responsibilities are clear and well documented.
- Develop a framework for training to help asset managers and all personnel identify who needs training and what that training should include as well as the need to track such training.
- Develop strategies for auditing compliance with policies and procedures.
- As business needs are identified by asset managers and through the other focus areas related to policy and procedures, work with those individuals to make any necessary changes.
- Develop processes to receive feedback on existing policies and procedures as well as to inform the creation of new policies and procedures.
- Develop information about state and federal requirements and ensure that they are adequately addressed through policies and procedures.

Goals

- Policies and procedures exist for all major Department functions.
- Policies and procedures are up-to-date and accessible.
- Policies and procedures are clearly mapped to individual employee responsibility and performance.
- Employee training is tracked, documented, and matched with individual responsibilities.
- Our files and data are adequately and efficiently curated.
- We routinely monitor and audit compliance with our policies and procedures.